

## PATENT CLAIMS

1. Head rest arrangement for a motor vehicle seat with
- 5       - a backrest frame for a backrest
- a head rest which can be fixed in at least one useful position on the backrest frame and which has a head rest body for supporting the head of a vehicle occupant
- 10       - a device for shifting the head rest in a crash situation in order to move the head rest body relative to the backrest frame into a predeterminable position which is different from the useful position, and
- a locking device which counteracts displacement of the head rest and which can be released in a crash situation
- 15       **characterised by**
- a device (6, 46, 47, 49) for keeping the adjusting device (4) in the unlocked state so long as the head rest is shifted out from the useful position.
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2. Head rest arrangement according to claim 1, **characterised in that** the locking device (4) is pretensioned by at least one first elastic element (47) in the direction of the locked state.
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3. Head rest arrangement according to claim 1 or 2, **characterised in that** the locking device (4) is assigned at least a second elastic element (46) with which the locking device (4) is biased in the direction of the unlocked state.

4. Head rest arrangement according to claim 1 or 2, **characterised in that** the head rest is locked in the at least one useful position under the action of the first elastic element (47) and against the action of the second elastic element (46).
5. Head rest arrangement according to claim 3 or 4, **characterised in that** the locking device (4) can be brought into the released state by means of the second elastic element (46).
6. Head rest arrangement according to one of the preceding claims, **characterised in that** at least one stop (69) is provided which when the locking device (4) is unlocked acts on a component part (42) of the locking device (4) so that the locking device (4) is held in a state defined by the interaction of the stop (69) with the component part (42).
7. Head rest arrangement according to claim 6, **characterised in that** the stop is formed by an engagement element (69) which can be brought into engagement with the component part (42) of the locking device (4), namely preferably through positive engagement.
8. Head rest arrangement according to claim 6 or 7, **characterised in that** during displacement of the head rest the stop (69) can be brought into a position in which it acts on the component part (42) of the locking device (4).
9. Head rest arrangement according to claim 8, **characterised in that** the stop (69) can be brought by swivel movement into the position where it acts on the component part (42) of the locking device (4).
10. Head rest arrangement according to claim 8 or 9, **characterised in that** when the locking device (4) is locked the stop (69) is held in a position in which it does not act on the locking device (4), and that when the head rest is displaced the stop (69) is released so that it can act on the locking device (4).

11. Head rest arrangement according to claim 10, **characterised by** a securing element (63) which is movable when the head rest is displaced and which releases the stop (69) when the head rest is displaced.
- 5 12. Head rest arrangement according to one of claims 6 to 11, **characterised in that** the stop (69) is pretensioned to a position where it acts on the locking device (4).
- 10 13. Head rest arrangement according to one of claims 7 to 12, **characterised in that** when the head rest is displaced the component part (42) of the adjusting device (4) is brought into a position where the engagement element (69) can engage in the component part (42).
- 15 14. Head rest arrangement according to claim 13, **characterised in that** the component part (42) of the locking device (4) during displacement of the head rest can be brought by an actuating element (45) which is movable during displacement of the head rest into the position where the engagement element (69) can engage in the component part (42).
- 20 15. Head rest arrangement according to one of the preceding claims, **characterised in that** the locking device (4) is mounted on the backrest frame.
- 25 16. Head rest arrangement according to one of the preceding claims, **characterised in that** the locking device (4) has a primary locking element (41) which in the locked state of the locking device (4) interacts with a holding element (45) of the head rest so that the head rest is not able to move and which (primary locking element) can be actuated so that it releases the holding element (45).
- 30 17. Head rest arrangement according to claim 16, **characterised in that** the holding element (45) during displacement of the head rest is movable relative to the primary locking element (41) after the primary locking element (41) has been actuated to release the locking device (4).
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18. Head rest arrangement according to claim 16 or 17, **characterised in that** the primary locking element (41) has a locking claw (41a) which in the locked state of the locking device (4) engages over the holding element (45).
- 5 19. Locking device according to one of claims 16 to 18, **characterised in that** the primary locking element (41) is formed by a swivel mounted locking pawl.
20. Head rest arrangement according to claim 3 and one of claims 16 to 19, **characterised in that** the primary locking element (41) is pretensioned by  
10 means of an elastic element (46) in the direction of the unlocked state.
21. Head rest arrangement according to claim 13 and one of claims 16 to 20, **characterised in that** the component part (42) of the locking device (4) is brought through action of the actuating element (45) on the primary locking  
15 element (41) into a position in which the engagement element (69) can engage in the component part (42).
22. Head rest arrangement according to claim 21, **characterised in that** the actuating element (45) is formed by the holding element (45).  
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23. Head rest arrangement according to one of claims 16 to 22, **characterised by** a secondary locking element (42) with which the primary locking element (41) can be held in a position in which the locking device (4) is locked and which can be actuated to unlock the locking device (4) so that it releases the primary  
25 locking element.
24. Head rest arrangement according to claim 23, **characterised in that** the secondary locking element (42) is formed by a locking lever.
- 30 25. Head rest arrangement according to claim 2 and claim 23 or 24, **characterised in that** the secondary locking element (42) is elastically pretensioned in the direction of the state in which it holds the primary locking element (41) in a position in which the locking device (4) is locked.

26. Head rest arrangement according to claim 20 and 25, **characterised in that** the elastic pretension of the primary locking element (41) on one side and of the secondary locking element (42) on the other are attuned with each other so that the secondary locking element (42) holds the primary locking element (41) in a position which corresponds to the locked state when the secondary locking element (42) has not been actuated to release the locking device (4).
27. Head rest arrangement according to claim 6 and one of claims 23 to 26, **characterised in that** the component part (42) of the locking device (4) is formed through the secondary locking element.
28. Head rest arrangement according to claim 6 and one of claims 23 to 27, **characterised in that** the stop (69) acts on the secondary locking element (42).
29. Head rest arrangement according to one of the preceding claims, **characterised in that** an unlocking mechanism (7) is provided to unlock the adjusting device (4) in a crash situation in order to allow displacement of the head rest.
30. Head rest arrangement according to claim 29, **characterised in that** the unlocking mechanism (7) can be triggered sensor-controlled more particularly by means of an acceleration or proximity sensor.
31. Head rest arrangement according to claim 29 or 30, **characterised in that** the unlocking mechanism (7) can be activated electrically and/or mechanically.
32. Head rest arrangement according to claim 31, **characterised in that** the unlocking mechanism (7) can be actuated by means of an electromagnet (70, 70').
33. Head rest arrangement according to one of claims 28 to 32, **characterised in that** the unlocking mechanism (7) has for acting on the locking device (4) a tension or push means (72) which is coupled to the locking device (4).

34. Head rest arrangement according to claim 23 and one of claims 28 to 33, **characterised in that** the unlocking mechanism (7) is coupled to the secondary locking element (42).
- 5 35. Head rest arrangement according to one of the preceding claims, **characterised in that** the device (6, 46, 47, 49) for keeping the locking device (4) in the unlocked state can be deactivated by moving the head rest back from a displaced position into its useful position.
- 10 36. Head rest arrangement according to claim 35, **characterised in that** the device (6, 46, 47) for keeping the locking device (4) in the unlocked state can be deactivated automatically as the head rest moves back into its useful position.
- 15 37. Head rest arrangement according to claim 11 and 36, **characterised in that** the deactivation is implemented through action of the securing element (63) on the locking device (4).
- 20 38. Head rest arrangement according to claim 14 and 37, **characterised in that** the actuating element (45) acts on the locking device (4) so that the engagement element (69) can be brought out of engagement with the component part (42) of the locking device (4).
- 25 39. Head rest arrangement according to claim 2 and claim 37 or 38, **characterised in that** the action of the securing element (63) on the engagement element (69) brings the locking device (4) into the locked state under the pretension of the first elastic element (47).